

## Patent Abstracts of Japan

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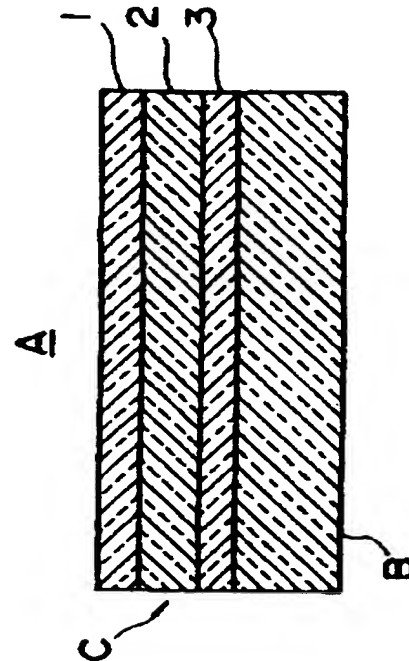
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APPLICANT : NIPPON SHEET GLASS CO LTD;

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TITLE : TRANSPARENT LOW REFLECTER



ABSTRACT : PURPOSE: To make a lowering of a reflectance in a region of center wavelength by increasing from a substrate side to an air side, the reflectance of the antireflection coating lying in the second layer among the three layers of the antireflection coating counting from the air side to the substrate side of the titled reflector.

CONSTITUTION:  $\text{MgF}_2$  having the reflectance  $n_1$  of 1.30~1.45 ranges is used as the material forming the first layer 1 having the low reflectance, the mixture of  $\text{ZrO}_2$  and  $\text{TiO}_2$  having the reflectance  $n_2$  of 1.95~2.15 ranges is used as the material forming the second layer 2 having the high reflectance. The mixture of  $\text{Al}_2\text{O}_3$  and  $\text{CeF}_3$  having the reflectance  $n_3$  of 1.60~1.80 ranges is used as the material forming the third layer 3 having the middle reflectance. The thicknesses  $n_1d_1$ ~ $n_3d_3$  of optical coatings in from the first layer to the third layer are  $n_1d_1=\lambda_0/4$ ,  $n_2d_2=\lambda_0/2$ , and  $n_3d_3=\lambda_0/4$  respectively. The reflectance of the transparent substrate B is 1.49~1.57. The coating C having  $\geq 0.02$  the difference of the reflectances between the air side A and the substrate side of the titled reflector is used as the second coating whereby the reflectance  $\lambda_0$  of the titled reflector in the region of the center wavelength depresses.

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